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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)


Applicant's or agent's file reference N.74368A DMG/IJB		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
FOR FURTHER ACTION		
International application No. PCT/GB99/00849	International filing date (day/month/year) 18/03/1999	Priority date (day/month/year) 20/03/1998
International Patent Classification (IPC) or national classification and IPC C12N15/55		
Applicant ST. GEORGE'S HOSPITAL MEDICAL SCHOOL et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
 - ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 05/10/1999	Date of completion of this report 08.06.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Moonen, P Telephone No. +49 89 2399 8538



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB99/00849

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-47 as originally filed

Claims, No.:

1-49 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

see separate sheet

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application.
☒ claims Nos. 21-24.

because:

- ☒ the said international application, or the said claims Nos. 21-24 relate to the following subject matter which does not require an international preliminary examination (*specify*):

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB99/00849

see separate sheet

- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☐ no international search report has been established for the said claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-36, 38-49
	No: Claims 37
Inventive step (IS)	Yes: Claims 2-5, 7-36, 38-49
	No: Claims 1 and 6
Industrial applicability (IA)	Yes: Claims 1-20, 25-49
	No: Claims

2. Citations and explanations

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/00849

Reference is made to the following documents:

- D1:** FR-A-2 682 967 (PASTEUR INSTITUT; UNIV MASSEY (FR)) 30 April 1993 (1993-04-30)
- D2:** EP-A-0 288 306 (MCFADDEN JOHN JO; TAYLOR JOHN HERMON (GB)) 26 October 1988 (1988-10-26)
- D3:** CHEMICAL ABSTRACTS, vol. 74, no. 5, 1 February 1971 (1971-02-01) Columbus, Ohio, US; abstract no. 20614, KHACHATURYAN, A. A. ET AL: 'Formation of acylases by hydrocarbon-oxidizing microorganisms' & BIOL. ZH. ARM. (1970), 23(7), 40-7
- D4:** WO 97/23624 (cited in the application as PCT/GB96/03221)
- D5:** Australian Veterinary Journal **72** (1995) 458-462

The documents D4-D5 were not cited in the international search report. A copy of D5 has been appended to the first written opinion.

Re Item I

Basis of the opinion

1. The sequence listings (substitute sheets 1-6; rule 26; published with WO 99/49054) have been taken into account.

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

2. For the assessment of the present claims 21-24 on the question whether they are industrially applicable, no unified criteria exist in the PCT Contracting States. The patentability can also be dependent upon the formulation of the claims. The EPO, for example, does not recognize as industrially applicable the subject-matter of claims to the use of a compound in medical treatment, but may allow, however, claims to a known compound for first use in medical treatment and the use of such a compound for the manufacture of a medicament for a new medical treatment.

Claims 21-24 relate to subject-matter considered by this Authority to be covered by the provisions of Rule 67.1(iv) PCT. Consequently, no opinion will be formulated with respect to the industrial applicability of the subject-matter of these claims (Article 34(4)(a)(i) PCT).

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

3. The present application concerns different aspects of the known pathogen *Mycobacterium avium*. One aspect is the identification within the genome of the subspecies *paratuberculosis* (MAP) of a new uninterrupted gene designated *mpa* (SEQ ID NO:1) coding for an enzyme (SEQ ID NO:2) having an acylase function. *Mycobacterium* is a known major producer of acylase (see D3). In another aspect, the application refers to newly identified mycobacterial insertion sequences in interrupted *mpa* genes of closely related but **less** pathogenic mycobacteria subspecies *silvaticum* and TMC724 (ATCC 25291); see page 2 lines 11-14 of the present description. It is therefore considered that these known, less-pathogenic mycobacteria are prejudicial to the novelty of **claim 37** on file (Art. 33(2) PCT).
4. The prior art has referred already to several genes specific for pathogenic mycobacteria: D4 is an example, disclosing a nucleotide sequence representing a pathogenicity island and D5 referring to a multiplex PCR based on the IS900 insertion sequence specific for *M. paratuberculosis* (see also D1 for IS900 and D2 for insertion sequences in mycobacteria in general).

Although it is known that virulent strains contain special lipids no prior art is available which would suggest to isolate and clone the encoding gene for the particular acylase referred to in the present application. An inventive step is acknowledged for the subject-matter clearly referring to the characterized acylase (referred to in part in claim 2 and depending claims) as well as to the newly found insertion sequences.

5. In view of the fact that acylase from mycobacteria has been described (see D3), it is considered that its purification and cloning of an encoding gene is obvious to the skilled person for the generally claimed subject-matter not characterized by a sequence.

Therefore, the present application does not satisfy the criterion set forth in Article 33(3) PCT because the subject-matter of claims 1 and 6 does not involve an inventive step (Rule 65(1)(2) PCT).

Re Item VIII

Certain observations on the international application

6. In conjunction with the above observation with respect to the lack of inventive step, it is noted that Article 6 of the PCT requires that all independent claims contain the essential technical feature(s) of the invention (see also Rule 6.3(b) PCT).

At present it is considered that the essential features of the present application relate to the specified mpa gene and its insertions.

7. Claims 2 and 5 refer to polynucleotide comprising a nucleotide capable of hybridising to a fragment of the nucleotide sequence set out in SEQ ID NO:1. The wording hybridising is undefined as it does not have a well-recognised meaning and leaves the reader in doubt as to the meaning of the technical features to which it refers, thereby rendering the definition of the subject-matter of said claims 2 and 5 and depending claims unclear (Article 6 PCT). The description is also not clear in defining the **minimal** requirement e.g. with respect to % of homology or hybridising conditions.

A similar objection is raised against claims 40 and 42, as well as claim 7 against "a polypeptide substantially homologous thereto".

PCTWORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : C12N 15/55, 15/85, 9/18, C07K 16/40, C12N 1/20, C12Q 1/68, 1/44, A61K 39/04, 48/00, 38/46 // (C12N 1/20, C12R 1:32)	A1	(11) International Publication Number: WO 99/49054 (43) International Publication Date: 30 September 1999 (30.09.99)
(21) International Application Number: PCT/GB99/00849 (22) International Filing Date: 18 March 1999 (18.03.99) (30) Priority Data: 9806093.2 20 March 1998 (20.03.98) GB (71) Applicant (for all designated States except US): ST. GEORGE'S HOSPITAL MEDICAL SCHOOL [GB/GB]; Cranmer Terrace, London SW17 0RE (GB). (72) Inventors; and (75) Inventors/Applicants (for US only): HERMON-TAYLOR, John [GB/GB]; St. George's Hospital Medical School, Dept. of Surgery, Cranmer Terrace, London SW17 0RE (GB). BULL, Timothy, John [GB/GB]; St. George's Hospital Medical School, Dept. of Surgery, Cranmer Terrace, London SW17 0RE (GB). (74) Agent: GOLDIN, Douglas, Michael; J.A. Kemp & Co., 14 South Square, Gray's Inn, London WC1R 5LX (GB).		(81) Designated States: AU, CA, JP, NZ, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the</i> <i>claims and to be republished in the event of the receipt of</i> <i>amendments.</i>
(54) Title: DIAGNOSTICS AND VACCINES FOR MYCOBACTERIAL INFECTIONS OF ANIMALS AND HUMANS (57) Abstract This invention relates to the protein, <i>Mycobacterium paratuberculosis</i> acylase (<i>mpa</i>) and the gene encoding <i>mpa</i> , which we have identified in the pathogen <i>Mycobacterium paratuberculosis</i> <i>Mptb</i> (also designated <i>Mycobacterium avium</i> subspecies <i>paratuberculosis</i> <i>MAP</i>), and to their use in the diagnosis of <i>Mptb</i> / <i>MAP</i> infections in animals and humans, as well as their use as components of vaccines for the prevention and treatment of diseases caused by <i>Mptb</i> / <i>MAP</i> . The importance of an intact uninterrupted <i>mpa</i> gene as a determinant of pathogenicity in <i>Mptb</i> / <i>MAP</i> is recognised and the invention also provides attenuated strains of normally pathogenic <i>Mptb</i> / <i>MAP</i> and other mycobacteria in which <i>mpa</i> has been inactivated, for use as vaccines.		

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
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DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 99/00849

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C12N15/55 C12N15/85 C12N9/18 C07K16/40 C12N1/20
C12Q1/68 C12Q1/44 A61K39/04 A61K48/00 A61K38/46
/(C12N1/20,C12R1:32)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12N C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 682 967 A (PASTEUR INSTITUT ;UNIV MASSEY (FR)) 30 April 1993 (1993-04-30) claims	1
A	EP 0 288 306 A (MCFADDEN JOHN JO ;TAYLOR JOHN HERMON (GB)) 26 October 1988 (1988-10-26) claims	1



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

16 July 1999

Date of mailing of the international search report

30/07/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Delanghe, L

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/00849

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>CHEMICAL ABSTRACTS, vol. 74, no. 5, 1 February 1971 (1971-02-01) Columbus, Ohio, US; abstract no. 20614, KHACHATURYAN, A. A. ET AL: "Formation of acylases by hydrocarbon-oxidizing microorganisms" XP002109388 abstract & BIOL. ZH. ARM. (1970), 23(7), 40-7 , -----</p>	1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB 99/00849

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
Remark: Although claim(s) 21 - 24
is(are) directed to a method of treatment of the human/animal
body, the search has been carried out and based on the alleged
effects of the compound/composition.
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such
an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all
searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment
of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report
covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is
restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/GB 99/00849

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2682967 A	30-04-1993	WO 9308284 A	29-04-1993
		EP 0666917 A	16-08-1995
		JP 7504082 T	11-05-1995
		NZ 244901 A	26-07-1995
EP 0288306 A	26-10-1988	AT 131533 T	15-12-1995
		AU 624574 B	18-06-1992
		AU 1628688 A	02-12-1988
		CA 1340172 A	08-12-1998
		DE 3854767 D	25-01-1996
		DE 3854767 T	05-09-1996
		DK 524289 A	22-12-1989
		EP 0356450 A	07-03-1990
		WO 8808456 A	03-11-1988
		JP 3503837 T	29-08-1991
		US 5225324 A	06-07-1993

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C. 20231
 ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 15 November 1999 (15.11.99)	
International application No. PCT/GB99/00849	Applicant's or agent's file reference N74368A DMG
International filing date (day/month/year) 18 March 1999 (18.03.99)	Priority date (day/month/year) 20 March 1998 (20.03.98)
Applicant HERMON-TAYLOR, John et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

05 October 1999 (05.10.99)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Juan Cruz Telephone No.: (41-22) 338.83.38
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PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference N74368A DMG	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 99/ 00849	International filing date (day/month/year) 18/03/1999	(Earliest) Priority Date (day/month/year) 20/03/1998
Applicant ST. GEORGE'S HOSPITAL MEDICAL SCHOOL et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☒ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☒ furnished subsequently to this Authority in computer readable form.

☒ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☒ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of Invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☒ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB 99/ 00849

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
Remark: Although claim(s) 21 - 24
is(are) directed to a method of treatment of the human/animal
body, the search has been carried out and based on the alleged
effects of the compound/composition.
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such
an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all
searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment
of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report
covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is
restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/GB 99/00849

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C12N15/55 C12N15/85 C12N9/18 C07K16/40 C12N1/20
 C12Q1/68 C12Q1/44 A61K39/04 A61K48/00 A61K38/46
 //(C12N1/20,C12R1:32)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12N C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 682 967 A (PASTEUR INSTITUT ;UNIV MASSEY (FR)) 30 April 1993 (1993-04-30) claims	1
A	EP 0 288 306 A (MCFADDEN JOHN JO ;TAYLOR JOHN HERMON (GB)) 26 October 1988 (1988-10-26) claims	1



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

16 July 1999

Date of mailing of the international search report

30/07/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Delanghe, L

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/00849

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>CHEMICAL ABSTRACTS, vol. 74, no. 5, 1 February 1971 (1971-02-01) Columbus, Ohio, US; abstract no. 20614, KHACHATURYAN, A. A. ET AL: "Formation of acylases by hydrocarbon-oxidizing microorganisms" XP002109388 abstract & BIOL. ZH. ARM. (1970), 23(7), 40-7 , -----</p>	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 99/00849

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(21) International Application Number: PCT/GB96/03221 (22) International Filing Date: 23 December 1996 (23.12.96) (30) Priority Data: 9526178.0 21 December 1995 (21.12.95) GB (71) Applicant (for all designated States except US): ST. GEORGE'S HOSPITAL MEDICAL SCHOOL [GB/GB]; Cranmer Terrace, London SW17 0RE (GB). (72) Inventors; and (75) Inventors/Applicants (for US only): HERMON-TAYLOR, John [GB/GB]; St. George's Hospital Medical School, Dept. of Surgery, Cranmer Terrace, London SW17 0RE (GB). DO- RAN, Tim [AU/AU]; 1/8 Oxford Street, Whillington, VIC 3219 (AU). MILLAR, Douglas [GB/AU]; Csiro, Division of Biomolecular Engineering, P.O. Box 184, North Ryde, NSW 2113 (AU). TIZARD, Mark [GB/GB]; St. George's Hos- pital Medical School, Dept. of Surgery, Cranmer Terrace, London SW17 0RE (GB). LOUGHLIN, Mark [GB/GB]; St. George's Hospital Medical School, Dept. of Surgery, Cran- mer Terrace, London SW17 0RE (GB). SUMAR, Nazira [GB/GB]; St. George's Hospital Medical School, Dept. of Surgery, Cranmer Terrace, London SW17 0RE (GB).	FORD, John [GB/GB]; St. George's Hospital Medical School, Dept. of Surgery, Cranmer Terrace, London SW17 0RE (GB). (74) Agents: GOLDIN, Douglas, Michael et al.; J.A. Kemp & Co., 14 South Square, Gray's Inn, London WC1R 5LX (GB). (81) Designated States: AU, CA, JP, NZ, US, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>Without international search report and to be republished upon receipt of that report.</i>	
(54) Title: NOVEL POLYNUCLEOTIDES AND POLYPEPTIDES IN PATHOGENIC MYCOBACTERIA AND THEIR USE AS DIAGNOSTICS, VACCINES AND TARGETS FOR CHEMOTHERAPY		
(57) Abstract <p>The invention provides a nucleotide sequence representing a pathogenicity island found in species of pathogenic mycobacteria. The islands are shown as SEQ ID NOs: 3 and 4 and comprises several open reading frames encoding polypeptides. These polypeptides and their use in diagnosis and therapy form a further aspect of the invention.</p>		

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